

Organisms and Their Environment

4-2 Students will demonstrate an understanding of the characteristics and patterns of behavior that allow organisms to survive in their own distinct environments. (Life Science)

4.2.6 Explain how organisms cause changes in their environment.

Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: Students have previously studied the ways environments influence plants (1-2.5, 1-2.6) and animals (2-2.6), but this is the first time that students explain how the organism causes changes to its environment. In 7th grade (7-4.3), students will explain the interaction among changes in the environment due to natural hazards, changes in populations, and limiting factors.

It is essential for students to know that all organisms cause changes in the environment where they live. Some of these changes are harmful to the organism or other organisms, while other changes are helpful to the organism or other organisms.

- Humans depend on their environments. Humans change environments in ways that can be either harmful or helpful for themselves and other organisms. Some examples of human behaviors that change environments may be:
 - polluting the air, but working to cut down emissions from cars and factories;
 - dumping toxic substances into waterways, but cleaning the water before factories put it back into the rivers, or creating river “greenways” where people and animals can enjoy the natural river surroundings.
 - cutting down trees to use the logs for building homes, but replacing the cut trees by planting new trees.
- Other organisms also impact the environments. Some of these changes can be harmful and some can be helpful. Some examples of how other organisms can change the environment may be:
 - herd animals might overgraze land leading to erosion, but they can also fertilize the fields on which they graze and new plants can grow;
 - beavers build dams which block the flow of water; but create pond environments in which new plants and animals can survive;
 - kudzu, a plant that was introduced from another environment, has overgrown many other plants and trees in their environment; but it can be used for food or other resources.

It is not essential for students to know about the effects of global warming or acid rain.

Assessment Guidelines:

The objective of this indicator is to *explain* how organisms cause changes in their environments; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the various ways that an environment is affected by organisms. However, appropriate assessments should also require students to *exemplify* ways that behaviors affect environments; or *compare* harmful and helpful ways organisms impact the environment.